



Strong gun laws are not enough: The need for improved enforcement of secondhand gun transfer laws in Massachusetts



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ABSTRACT

Objective. Research suggests that an overwhelming majority of crime guns were transferred by private sellers before recovery by law enforcement. Unfortunately, most states do not regulate these transactions. This study examines whether analyses of state-level private transfer data could be used to develop interventions to reduce the supply of handguns to violent criminals.

Methods. Traced Boston crime handguns first sold at Massachusetts license dealers were matched to state secondhand gun transfer data. Logistic regression and descriptive statistics were used to analyze the characteristics of recovered crime guns and in-state primary and secondary market transaction patterns.

Results. For crime handguns with records of secondary market transactions in Massachusetts, many rapidly move from private transfer to recovery by the police. Unfortunately, important transaction data on the in-state sources of nearly 63% of recovered handguns were not readily available to law enforcement agencies.

Conclusions. Data on private transfers of guns could be used to prevent violent injuries by reducing criminal access. However, the passage of strong private transfer gun laws needs to be accompanied by investments in the vigorous enforcement of reporting requirements.

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Introduction

In 2011, there were over 11,000 gun homicide victims and some 467,300 victims of non-fatal firearm crime in the United States (Planty and Truman, 2013). Guns are frequently used in crime in the United States partly because they are so easy to acquire. This ease of access is partly attributable to the fact that there are two systems of gun commerce in this country, one involving licensed gun retailers and the other based on secondhand gun transactions by private-party gun sellers, and only the first of these systems is regulated under federal law. Federal firearm laws requiring licensed dealers to complete criminal background checks of prospective buyers and to maintain records of firearm transactions, including the manufacturer and serial number of firearms, purchaser identification, sale date, and other information, do not apply to private sales. Moreover, Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) gun tracing is limited to capturing the first retail sale at licensed dealers (Braga et al., 2002). As such, it is not surprising that criminals seem to prefer acquiring secondhand firearms. Some 85% of all guns used in crimes and then recovered by law-enforcement agencies have been sold at least once by private parties (Wintemute et al., 2010).

Gun control advocates suggest that gun deaths and injuries could be reduced by the universal adoption of federal and state laws requiring criminal background checks and transaction recordkeeping for all firearm sales (see, e.g., Bloomberg, 2013). Massachusetts is one of a relatively small number of states that currently extend firearm transaction recordkeeping requirements to sales by private, unlicensed sellers (Webster et al., 2013). Massachusetts state law requires its citizens to record and report all firearm sales, transfers, inheritances, and losses. In this article, we examine the prospects of reducing the flow of secondhand guns to criminals by analyzing ATF trace data and Massachusetts gun ownership transfer data for successfully-traced handguns recovered by the Boston Police Department (BPD). We find that computerized data on sales of secondhand firearms hold great potential for understanding and shutting down illicit secondary market sources of guns to criminals. However, we also find the available computerized gun records to be surprisingly incomplete, suggesting a lack of investments made in regulating and enforcing state gun commerce laws in Massachusetts.

Literature review

Federal law establishes a minimum set of restrictions on the acquisition and possession of guns (Zimring, 1975). Some states enact more stringent firearm laws that exceed the minimum standards set by federal law. Legal firearm commerce is composed of transactions made in the

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primary firearm market and in the largely unregulated secondary firearm market. Transactions of new and secondhand firearms conducted through Federal Firearms Licensees (FFLs) form the primary market for firearms (Cook et al., 1995). Retail gun stores sell both new and secondhand firearms and, in this regard, resemble automobile sales lots. Once a gun is in private hands, it can be transferred in a wide variety of ways such as through classified ads in newspapers and gun magazines, online sales, and at gun shows (which include both licensed and unlicensed dealers). Transfers of secondhand firearms by unlicensed individuals form the secondary market, where no records are kept in most states and criminal background checks are not required (Cook et al., 1995). About 30–40% of all gun transactions occur on the secondary market (Cook and Ludwig, 1996).

The secondary gun market, sometimes called the private-party or informal gun market, has long been recognized as a leading source of guns used in crimes (Wintemute et al., 2010). Although secondary market sales are primarily a convenience for the law-abiding, such sales are also the principal option when the prospective purchaser is a felon, domestic violence offender, or other person prohibited by law from owning a gun. Secondary market sales facilitate the diversion of guns from legal commerce into criminals' hands: although it is always illegal for prohibited persons to buy a gun, it is only illegal to sell a gun to such people if the seller knows or has reasonable cause to believe that he or she is doing so. Unscrupulous private sellers may simply avoid asking questions that would lead to such revelations (Wintemute, 2009).

Primary and secondary firearm markets are closely linked because many buyers move from one to the other depending on relative prices and other terms of the transaction (Cook and Leitzel, 1996). As regulations tighten in the primary market, Cook et al. (1995) suggest that the unregulated secondary market will become increasingly attractive. For instance, implemented in February 1994, the Brady Handgun Violence Prevention Act required licensed dealers to conduct a background check on all handgun buyers and mandated a one-week waiting period before transferring the gun to the purchaser. In November 1998, waiting periods for background checks were eliminated for a National Instant Check System (NICS). Maintained by the Federal Bureau of Investigation, NICS is used by FFLs to determine whether a prospective gun buyer doesn't have a criminal record or isn't otherwise ineligible to make a purchase. Over a five-year period (1994–1999), 13 million Brady criminal background checks were conducted for prospective handgun purchasers (BJS, 1999). Nearly 320,000 requests were denied, of which 220,000 were due to prior felony convictions or pending indictments (BJS, 1999). Nevertheless, it seems easy enough for criminals to circumvent the provisions of the Brady Act by acquiring guns through the unregulated secondary market (Jacobs and Potter, 1995). An evaluation of the Brady Act found no discernible impact on homicide trends and suggested that criminals acquiring firearms from the unregulated secondary market may have undermined the effectiveness of the Brady Act in preventing homicide (Ludwig and Cook, 2000).

States vary greatly in the nature of their gun purchase laws and gun dealer regulation policies and procedures (Vernick et al., 2006). Vernick and Hepburn's (2003) examination of state gun laws classified states as having no purchase and registration laws, purchase only laws, registration only laws, or both. Firearm purchase laws require prospective gun buyers to first obtain a license or permit before purchasing a firearm. Registration laws mandate permanent records of each gun sale that are kept by states in centralized locations. Some states do not have permit-to-purchase laws but do have laws requiring background checks for private sales. A growing body of empirical evidence suggests that more restrictive state-level firearm sales laws may reduce the illegal diversion of guns from lawful commerce to criminals (Webster et al., 2013). Further, Pierce et al. (2015) found that California enforcement of state laws and regulations through routine dealer inspections and the ongoing

analysis of automated records on firearm transactions for suspicious sales and purchase patterns made it more difficult for prohibited persons to acquire guns from in-state dealers where all private-party transfers must be routed through a license retailer.

Data and analytical framework

The Gun Control Act of 1968 (GCA) established a set of requirements that allows any given firearm to be traced from its manufacture or import to its first sale by a retail dealer (Zimring, 1975; Cook and Braga, 2001). The GCA mandates that each new firearm, whether manufactured in the United States or abroad, must be marked with a serial number. In addition, the GCA requires all FFLs, including manufacturers, importers, distributors, and retail dealers, to maintain records of all firearm transactions. Firearm traces can be unsuccessful for a variety of reasons such as the following: local police incorrectly completed the trace request form, the firearm was too old to trace (pre-1968 manufacture), or the gun had obliterated serial numbers. ATF trace data can provide policy-relevant insights on illegal gun market dynamics when conclusions are based on careful analyses that are coupled with clear acknowledgments of the data limitations (Cook and Braga, 2001; Wellford et al., 2005). The BPD has been comprehensively submitting all recovered firearms to ATF for tracing since 1991 (Kennedy et al., 1996; Braga and Pierce, 2005). Between 2007 and 2013, the BPD recovered 3764 firearms. This research analyzed trace data for the $N = 3202$ handguns recovered by the BPD during this time period (85.1% of 3764).

Massachusetts General Laws Chapter 140, Sections 128A and 128B, requires all individuals who sell, transfer, inherit, or lose a firearm to report the sale, transfer, inheritance, or loss of the firearms to the Firearms Records Bureau (FRB) of the Massachusetts Department of Criminal Justice Information Service (<http://www.mass.gov/eopss/firearms-reg-and-laws/frb/>). The state form required for private gun transfer is known as an FA10 form (replacing the "blue cards" previously used for private sales). Private transactions can be completed electronically by using the Massachusetts Firearms Registration and Transfer System. Alternatively, a paper FA10 form can be obtained from any police department. The seller must fill out the form and forward it to the Firearms Record Bureau (FRB) within seven days of the transaction. As will be described further below, the manufacturers and serial numbers of Massachusetts-sourced traced handguns not recovered in the hands of the first retail purchasers were run through the computerized Massachusetts firearm purchase and sales database to determine whether there was a record of a subsequent transfer of ownership via a secondhand sale. These same Massachusetts-sourced handguns that were not recovered in the hands of the first retail purchasers were then run through the online National Crime Information Center stolen gun file to determine whether owners had reported their handguns as stolen during the time period between the first retail sale and recovery by the BPD.

ATF and academic analyses of firearm trace data typically focus on a critical dimension of the illegal firearms market: the time between a firearm's first sale at retail and its subsequent recovery by a law enforcement agency, most often in connection with a crime ("time-to-crime"). Law enforcement investigators consider a traced firearm with short time-to-crime, defined as recovery within 3 years of first retail sale, as possibly having been recently and illegally diverted from a retail outlet (ATF, 2002). Research has also identified a number of gun trafficking indicators associated with short time-to-crime, such as multiple low-quality semiautomatic pistols purchased at an FFL in a loose-control state recovered from prohibited possessors in a tight control state that were not the original retail purchasers (Pierce et al., 2004; Braga et al., 2012). Selected gun trafficking indicators relevant to private transfers, such as different purchaser and possessor information and the time between the last known sale and recovery by the BPD, were created to

investigate possible suspicious purchase and sales patterns. “Junk guns” are the least expensive firearms and, as suggested by Webster et al. (2013), their low price enables traffickers to invest relatively little money in guns that can sell for nearly five times more than retail prices in states with the most restrictive gun laws. For the purposes of our analysis, recovered handguns were characterized as “low quality” firearms if they were manufactured by Hi-Point Firearms, “ring of fire” firearm companies (Bryco, Jennings, Lorcin, Davis, etc.; Wintemute, 1994) or their descendants (Cobra Industries, Jiminez, Talon, Sedco, etc.), or companies popularly-recognized as a manufacturers of cheap firearms (see, e.g., <http://junkguns.com/>).

Our analysis of these data proceeds as follows. Descriptive statistics are used to summarize the characteristics of all handguns recovered by the BPD during the study time period and the results of ATF tracing. For handguns traced to their first known retail sale by an FFL, selected gun trafficking indicators, such as time-to-crime, source states, and characteristics of retail purchasers and recovery possessors, are also presented. We then examine whether there are any systematic differences between traced handguns originating from in-state licensed dealers as compared to those originating from out-of-state licensed dealers. A logistic regression model (Aldrich and Nelson, 1984) was used to analyze the characteristics and gun trafficking indicators associated with recovered Boston handguns first sold at retail at Massachusetts FFLs relative to recovered Boston handguns first sold at FFLs in other states. Data characterizing gun commerce patterns are presented for recovered Boston handguns with subsequent secondhand gun ownership transfers in Massachusetts. Stata 13.1 statistical software was used for all statistical analyses.

Table 1
Characteristics of handguns recovered by the Boston Police Department, 2007–2013.

N = 3202		
Characteristics	N	Percent
<i>Type</i>		
Semiautomatic pistol	2127	66.4
Revolver	1027	32.1
Derringer	48	1.5
<i>Caliber</i>		
9 mm	682	21.3
.38	470	14.7
.22	462	14.4
.380	354	11.1
.45	291	9.1
.40	252	7.9
.25	229	7.2
.357	193	6.0
.32	178	5.6
.44	47	1.5
Other calibers	44	1.4
<i>Top manufacturers</i>		
Smith & Wesson	561	17.5
Sturm Ruger	279	8.7
Taurus	168	5.2
Colt	161	5.0
Hi-Point	139	4.3
Glock	138	4.3
Beretta	128	4.0
Harrington & Richardson	87	2.7
Walther	84	2.6
Lorcin	74	2.3
Bryco	71	2.2
Sig-Sauer/Sig Arms	64	2.0
Other manufacturers	1248	38.9
<i>Recovery crime type</i>		
Illegal gun possession	2054	64.2
Found in public places	931	29.1
Violent crime	168	5.2
Drug offense/other	49	1.5

Results

Characteristics of handguns recovered by BPD and ATF trace results

Table 1 presents the basic characteristics of N = 3202 handguns recovered by the BPD between 2007 and 2013. Slightly less than two-thirds of the recovered handguns were semiautomatic pistols (66.4%) and nearly one-third were revolvers (32.1%). Derringers accounted for a very small portion of the recovered handguns (1.5%). A variety of calibers were represented among the recovered handguns. The most frequent recovered caliber handguns included: 9 mm (21.3%), .38 (14.7%), .22 (14.4%), .380 (11.1%), .45 (9.4%), and .40 (7.9%). Smith & Wesson manufactured the largest share of recovered handguns (17.5%) with the remainder manufactured by a number of reputable (e.g. Sturm Ruger, Colt, Glock, and Beretta) and lower-quality (e.g. Hi-Point, Lorcin, and Bryco) companies. A majority of the handguns were recovered by the BPD in illegal firearm possession crimes (64.2%) and a small share of the handguns were recovered in violent crimes (homicide, aggravated assault, and robbery; 5.2%). Slightly more than 29% of handguns were recovered in public places (e.g. hidden under a park bench, concealed in a car wheel well, and thrown on street by suspects that were not apprehended) by BPD officers.

ATF was able to successfully trace 56.6% (N = 1813) of the Boston recovered handguns to their first known retail sale (Table 2). Incorrectly completed trace request forms were the most frequent reason that trace attempts were not successful (21.0%) followed by firearms not having serial numbers (11.0%) and pre-1968 firearm manufacture (8.0%). In a small number of trace attempts, the dealer could not locate the 4473 sale form for the firearm (2.2%) or reported the firearm stolen from its inventory (1.2%). Nearly one third of the recovered handguns (N = 587, 32.4%) were first sold at retail at a Massachusetts FFL. Almost one quarter of the recovered handguns were traced to first retail sales at loose-control I-95 southern states (24.4%; specifically, Florida, Georgia,

Table 2
ATF trace results and selected gun trafficking indicators for Boston recovered handguns, 2007–2013.

Total N = 3202		
	N	Percent
<i>Trace results</i>		
Traced to first retail purchaser	1813	56.6
Trace form not filled out correctly	673	21.0
Firearm does not have a serial number	352	11.0
Firearm manufactured before 1968	257	8.0
Dealer received firearm but doesn't have 4473	70	2.2
Dealer reported firearm stolen	37	1.2
<i>Traced N = 1813</i>		
	N	Percent
<i>Source state</i>		
Massachusetts	587	32.4
I-95 southern states	496	24.4
New Hampshire, Maine	324	17.9
Other states	406	22.3
<i>Retail purchaser gender</i>		
Male	1614	89.0
Female	199	11.0
<i>Purchaser and possessor identification</i>		
Purchaser and possessor are different people	1035	57.1
Purchaser identified, possessor not known	657	36.2
Purchaser and possessor is the same person	121	6.7
<i>Time to crime</i>		
Recovered within 3 years of first retail sale	376	20.7
Recovered more than 3 years of first retail sale	1437	79.3
Median time to crime	10.8 years	
Range	3 days–43.8 years	

North Carolina, South Carolina, and Virginia). FFLs located in New Hampshire and Maine, both proximate states with weak gun controls, were the first retail sale sources for 17.9% of the traced handguns.

The vast majority of traced handguns were first purchased by males (89.0%) rather than females (11.0%). Very few traced handguns were recovered in the hands of the first retail purchaser (6.7%). More than half of the traced handguns were recovered from a possessor who was not the first retail purchaser (57.1%). The remaining traced handguns were recovered in public places without a known possessor (36.2%), suggesting a possible transfer from a legal owner to a criminal possessor. Slightly more than twenty percent of traced handguns were recovered by the BPD within three years of the first retail sale. The median time to crime was 10.8 years.

Comparison of traced handguns sold at Massachusetts FFLs relative to FFLs in other states

Table 3 presents the results of the logistic regression of recovered Boston handguns traced to Massachusetts FFLs relative to FFLs in other states on selected traced handgun characteristics. The binary dependent variable represented whether a recovered Boston handgun was first sold at retail by an in-state Massachusetts FFL (1) or first sold at retail by an out-of-state FFL (0). The logistic regression model tested whether specific handgun characteristics (type, caliber, and manufacturer quality), recovery crime type (illegal possession relative to found guns and other recovery crimes), and gun trafficking indicators (time to crime, female retail purchaser, and recovery from someone other than the first retail purchaser) were statistically-significant predictors of the log of the odds of a recovered Boston handgun having its first retail sale at a Massachusetts FFL. Odds ratios were used to represent the impact of a one-unit change in the predictor variables on the ratio of the probability that a recovered Boston handgun was first sold at retail by a

Massachusetts FFL to the probability that a recovered Boston handgun was first sold at retail by an FFL in another state.

Beyond a larger share of low-quality handguns represented among recovered Boston handguns first sold at out-of-state FFLs, the types, calibers, and age of recovered Boston handguns were not significantly different whether the firearms were first sold by an in-state or out-of-state licensed dealer. Controlling for the other covariates, recovered Boston handguns first sold at Massachusetts FFLs relative to out-of-state FFLs were not more or less likely to be semiautomatic pistols, revolvers, or derringers. Similarly, recovered Boston handguns first sold at Massachusetts FFLs relative to out-of-state FFLs were not more or less likely to be .380, 9 mm, .40, or .45 caliber firearms. The time between the handguns first retail sale and recovery by BPD, as measured by the share of traced handguns with a time to crime less than 3 years, was not significantly different for handguns sold by Massachusetts FFLs relative to handguns sold by out-of-state FFLs. However, Massachusetts FFL-sourced recovered Boston handguns were 80.3% less likely to be manufactured by a low-quality manufacturer when compared to out-of-state-sourced Boston recovered handguns ($p < .01$). Like the findings of an evaluation of a similar law banning “Saturday night specials” sales in Maryland (Vernick et al., 1999), Massachusetts state law banning junk gun sales seems to influence where low-quality Boston crime guns are first purchased.

There were some noteworthy differences in first retail purchaser and recovery possessor patterns for traced Boston recovered handguns. Holding the other variables constant, Massachusetts FFL-sourced recovered Boston handguns were 75.6% less likely to be first purchased at retail by a female when compared to out-of-state FFL sourced Boston recovered handguns ($p < .01$). Moreover, recovered Boston handguns first sold at Massachusetts FFLs were nearly five times as likely to be recovered in the possession of the first purchaser ($p < .01$) and 53.5% less likely to be recovered in the hands of a possessor who was not the first purchaser ($p < .01$) when compared to out-of-state FFL sourced Boston recovered handguns. Finally, handguns traced to first purchases at Massachusetts FFLs were 22.8% less likely to be recovered in illegal gun possession offenses relative to handguns traced at first purchases at FFLs in other states. Taken together, these differences suggest that, relative to handguns first purchased in other states, the BPD consistently recovers handguns from males who misused their handguns that were legally-purchased from Massachusetts FFLs.

Recorded secondhand transfers of Massachusetts-sourced Boston recovered handguns

Some 587 handguns recovered by the BPD between 2007 and 2013 were traced to a first retail purchase at a Massachusetts FFL (Fig. 1). Only 16.2% (95) were recovered by BPD officers in the possession of the first retail purchaser. The remaining Boston recovered handguns were recovered from public places without a known possessor (44.5%, 261) and from possessors who were not the first retail purchasers (39.4%, 231). The manufacturers and serial numbers of the 492 Boston recovered handguns not recovered in the hands of the first retail purchaser were run through the computerized Massachusetts firearm purchase and sales database and the NCIC stolen firearm database. These searches revealed that only 29.1% (143) had records of secondhand transfers in the Massachusetts firearm purchase and sales database and 10.8% (53) were reported stolen in the NCIC database. Thirteen handguns appeared in both databases. Surprisingly, 62.8% (309) of the 492 Boston recovered handguns that should have had records did not appear in either the Massachusetts firearm purchase and sales database or the NCIC stolen firearm database.

Secondhand gun transfer patterns

Many of the 143 handguns with secondhand transfer records had multiple transfers before recovery by the BPD. Some 42.7% of the recovered handguns had more than one recorded ownership transfer after

Table 3
Logistic regression of recovered Boston handguns traced to Massachusetts FFLs on selected traced handgun characteristics, 2007–2013.

N = 1813		
Predictor	Odds ratio	95% C.I. Lower, upper
Revolver	.84	.65, 1.03
Derringer	1.39	.56, 4.12
9 mm, .380, .40, .45	.99	.88, 1.10
Low quality manufacturer	.19**	.14, .27
Illegal possession	.77*	.60, .98
Time to crime ≤ 3 years	1.10	.82, 1.47
Female first purchaser	.24**	.14, .40
Same purchaser/possessor	4.73**	2.88, 7.75
Different purchaser/possessor	.46**	.36, .58
Constant	2.33**	
– 2 log likelihood	1888.85	
Nagelkerke R square	.27	

S.E. = standard error.

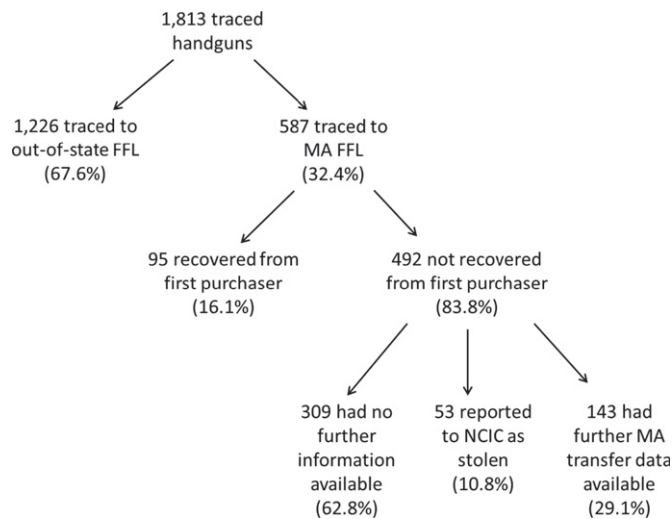
C.I. = confidence interval.

Notes: dependent variable is traced to a Massachusetts FFL (1) or traced to an FFL in another state (0).

Semiautomatic pistol (0) was the reference category for the revolver (1) and derringer (1) polychotomous dummy variable. Other handgun caliber was the reference category (0) for handguns with 9 mm, .380, .40, and .45 caliber (1) dummy variable. Quality handgun manufacturer was the reference category (0) for low-quality handgun manufacturer (1) dummy variable. Other crime and found gun was the reference category (0) for the illegal gun possession (1) dummy variable. Time to crime greater than 3 years was the reference category (0) for the time to crime less than or equal to 3 years (1) dummy variable. Male first purchaser (0) was the reference category for the female first purchaser (1) dummy variable. First purchaser identified but crime gun possessor not known (0) was the reference category for the same first purchaser and recovery gun possessor (1) and different first purchaser and recovery gun possessor (1) polychotomous dummy variable.

* $p < .05$.

** $p < .01$.



Note: Thirteen of the 492 Boston handguns not recovered from the first purchaser appeared in both the NCIC stolen gun and the MA firearm transfer databases.

Fig. 1. Database information available for Boston recovered handguns, 2007–2013. Note: thirteen of the 492 Boston handguns not recovered from the first purchaser appeared in both the NCIC stolen gun and the MA firearm transfer databases.

the first retail sale. Overall, these 143 handguns had a mean of 1.9 recorded secondhand transfers that ranged from one ownership transfer to six ownership transfers before recovery by the BPD. For the last known gun ownership transfer before BPD recovery, 51.7% involved a transfer from an FFL to a purchaser (74) and 48.3% involved a transfer from a private seller to a purchaser (69). BPD officers recovered only 22.4% (32) of these 143 handguns from the last known purchaser. The remaining handguns were recovered from public places without a known possessor (43.3%, 62) and from a possessor who was not the last known purchaser (34.3%, 49).

Characteristics of secondhand gun purchasers

The 143 recovered handguns with secondhand transfers were made by 131 unique last known purchasers. The vast majority of these purchasers were associated with a single secondhand gun ownership transfer (93.2%, 122) while six purchasers were associated with two recovered handguns and one purchaser was associated with three recovered handguns. The 131 unique purchasers had a mean of 8.2 and a median of 4 other firearm transactions in the Massachusetts purchase and sales database with a range of one through 114 transactions. Some 18.3% (24) had only one transaction on record and 51.1% (67) had 4 or fewer transactions on record. Nearly all of the last known purchasers were male (92.4%, 121). For the 122 purchasers with date-of-birth information available, the mean age at the time of the transaction was 35.4 years with a range of 19 years to 89 years of age and 46.7% aged 30 or younger (57).

Revised time to crime estimates

The updated gun ownership transfer data allowed for a more precise estimate of the time between the last known transaction and recovery by the BPD for these 143 handguns. Using ATF trace data, the median time between the first retail sale and recovery by BPD was 14.1 years with 18.9% (27) recovered within three years of the first retail sale. Using Massachusetts firearm transfer data, the median time between the last known secondary transfer and recovery by the BPD was 4.6 years with 37.1% (53) recovered within three years of the last known handgun ownership transfer. A two-sample difference of proportions test confirmed that 18.2% difference in the share of “fast” time-to-crime handguns reported by the updated Massachusetts gun ownership transfer information represented a statistically-significant

increase over the share of fast time-to-crime handguns reported by ATF trace data ($z = 3.428, p < .001$).

Discussion

Massachusetts has been lauded for having some of the strongest gun laws in the United States. In 2013, the Brady Campaign to Prevent Gun Violence ranked Massachusetts gun laws as the 6th strongest among gun laws in the 50 states (<http://www.bradycampaign.org/2013-state-scorecard>). Importantly, Massachusetts regulates all secondhand gun transactions. Massachusetts state law requires that all gun sales, transfers, inheritance, or losses/thefts be reported to the FRB. These laws mandate that the first offense be punished by a fine of not less than \$500 nor more than \$1000 and for any subsequent offense by imprisonment in state prison for not more than ten years. Unfortunately, our analyses suggest that a highly problematic gap exists in Massachusetts between having strong gun laws in place and actually enforcing their provisions.

Between 2007 and 2013, the BPD recovered 492 Massachusetts-sourced handguns either in the hands of someone other than the first retail purchaser or on the streets of Boston. All these recovered handguns should have records of ownership transfers, losses, and thefts after the first retail sale. Unfortunately, only 29% of these handguns had computerized records of secondhand gun transfers and nearly 11% were reported as stolen. Whether ownership changes, losses, and thefts are simply not being reported by gun owners via the online submission system or submitted hardcopy paperwork is not being entered into the computerized FRB database, important transaction information on the in-state sources of nearly 63% of recovered handguns is not readily available to BPD investigators. Until these records are readily available, law enforcement officials will be challenged to identify and apprehend gun traffickers diverting secondhand firearms in Massachusetts. With almost one third of Boston's traceable recovered handguns originating from Massachusetts FFLs, it seems clear that more resources need to be dedicated to improving in-state recordkeeping and regulating secondhand transfers from FFLs and private parties. Improved in-state recordkeeping would also make it possible to compare the characteristics of traced crime handguns in Boston with the characteristics of handguns not recovered in crime, a limitation of the current study.

For those recovered Boston handguns with recorded secondhand transactions, our comparison revealed that including information on the last known purchaser of a firearm significantly reduced the median time-to-crime of Massachusetts-sourced recovered handguns relative to time-to-crime calculations based on standard ATF trace data. This finding reveals that Massachusetts handguns sometimes move very rapidly from subsequent market transactions to use in crime. Similar to prior analyses in California (Pierce et al., 2013; Wintemute et al., 2004), ATF firearm trace data enhanced by in-state subsequent transaction information can be very useful in guiding law enforcement actions against gun traffickers and criminals directly acquiring firearms through secondary market sources.

Conflict of interest

The authors declare that there are no conflicts of interest.

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